

EFFICACY OF TWO SILICONE-HYDROGEL CONTACT LENSES FOR BANDAGE USE AFTER PHOTOREFRACTIVE KERATECTOMY



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1. INTRODUCTION

The aim of the study was to evaluate the efficacy of two silicone hydrogel (SiH) contact lenses, approved for continuous wear for one week, following photorefractive keratectomy (PRK).

2. METHODS

Forty seven patients (22 men and 25 women) with an average age of 29±10 years were enrolled in this prospective, double-masked, comparative, clinical study. All patients underwent bilateral PRK for the correction of myopia (94 eyes), at the Institute of Vision and Optics, University of Crete. Recruitment was performed in a prospective consecutive non-randomized fashion. Using a sample size of 40 the study was designed to detect a difference in “epithelial defect size” of 2.3 with 80% power, at a significance level of 5%.

At the end of the PRK procedure, one eye of each patient was fitted with a Lotrafilcon B contact lens (Ciba Vision, Duluth, GA, US; 30-day recommended replacement) whereas the fellow eye was fitted with an Asmofilcon A lens (Menicon, Nagoya, Japan; 14-day recommended replacement). The lens type fitted in each eye was counterbalanced.

Epithelial defect size was assessed using slit lamp biomicroscopy on the day of surgery and at days 1 to 4 post-operatively. Post-operative examination also included assessment of uncorrected and best-corrected logMAR acuity (Precision Vision, LaSalle, USA)) and retinal straylight C-Quant, Oculus Optigrate, Germany) at one month post-operatively.

Epithelial defect size was calculated from the area (A) of the epithelial defect using the following equation (Grentzelos et al., 2009 and Engle et al., 2005):

$$A = \pi [(a+b)/4]^2$$

where, *a* and *b* were the longest and shortest dimensions of the defect, respectively. Figure 1 depicts characteristic images of the cornea of the same eye at different post-operative days. It is evident that the size of epithelial defect is significantly reduced on the third post-operative day

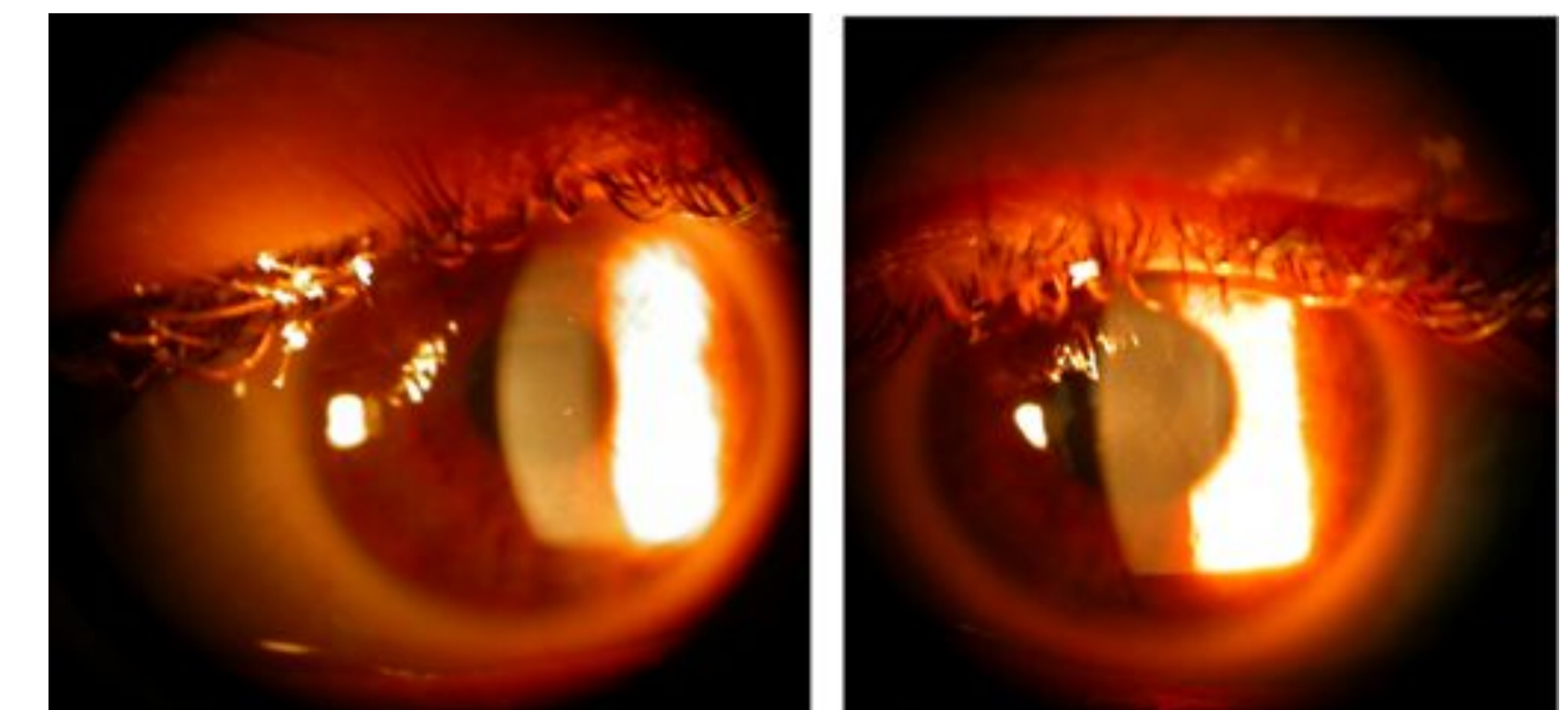


Figure 1: Slit lamp biomicroscopic images of the same eye at day 1 (left) and day 3 (right), post-operatively.

3. RESULTS

On average larger areas of epithelial defect were observed with the Lotrafilcon B lenses compared to the Asmofilcon A lenses. Statistically significant differences were observed for epithelial defect size, between the two types of lenses at day 1 (Lotrafilcon B vs Asmofilcon A: 27.1±9.9 vs. 25.5±11.00 mm², p=0.007) and day 2 (Lotrafilcon B vs Asmofilcon A: 9.2±9.5 vs. 6.3±7.0 mm², p=0.012) post-operatively (Figure 2).

At day 2 post-operatively, 8.5% (4/47) eyes fitted with the Asmofilcon A lens, compared to 6.4 % (3/47) of the eyes fitted with the Lotrafilcon B lenses were fully re-epithelialised ($\chi^2=0.76$, p>0.10). At the 3rd post-operative day, re-epithelialisation has been completed in 87.2% (41/47) of the eyes fitted with the Asmofilcon A lens, compared to 74.5 % (35/47) of the eyes fitted with the Lotrafilcon B lens ($\chi^2=8.57$, p=0.012),

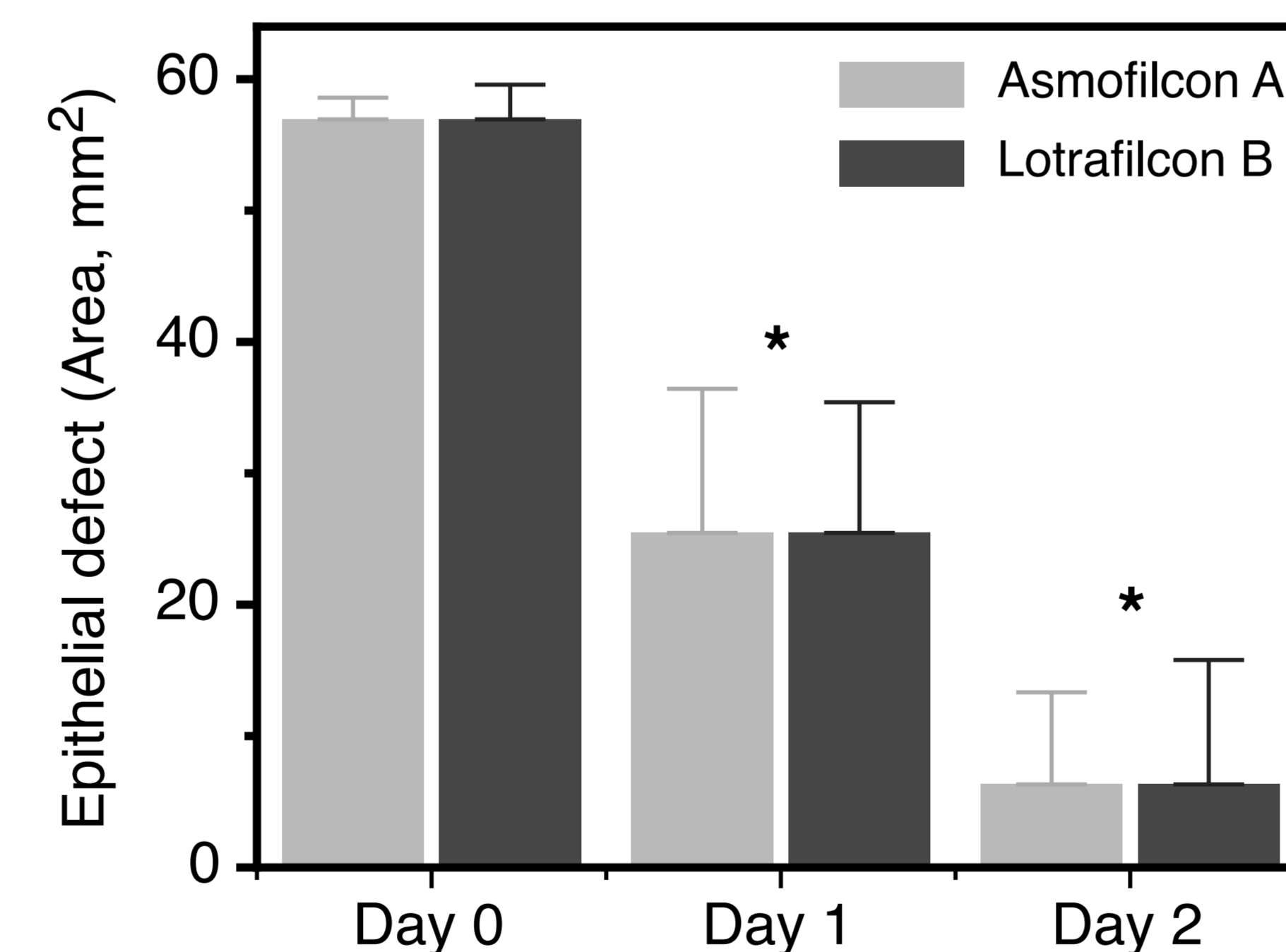


Figure 2: Plot of the average area of epithelial defect size for the two silicone hydrogel lenses at all post-operative days. Error bars represent 1 SD.

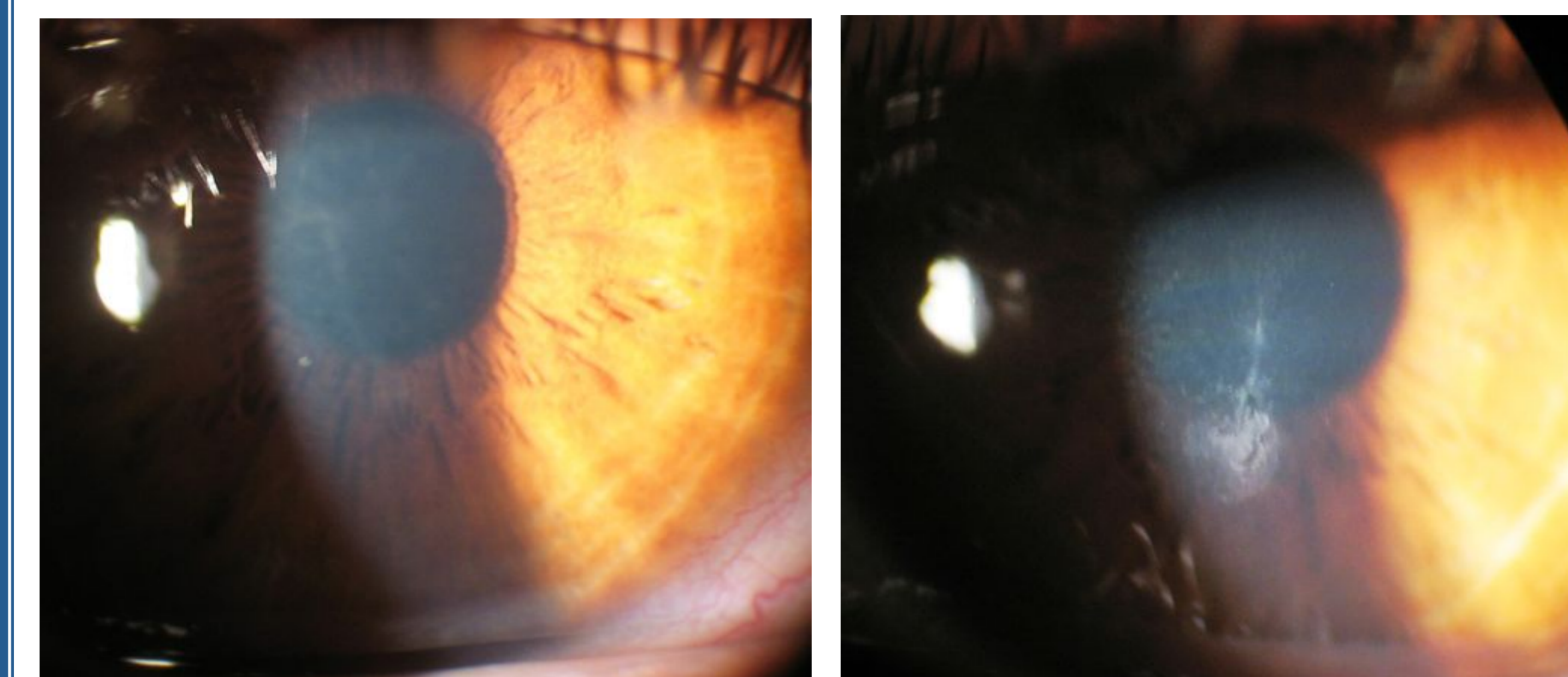
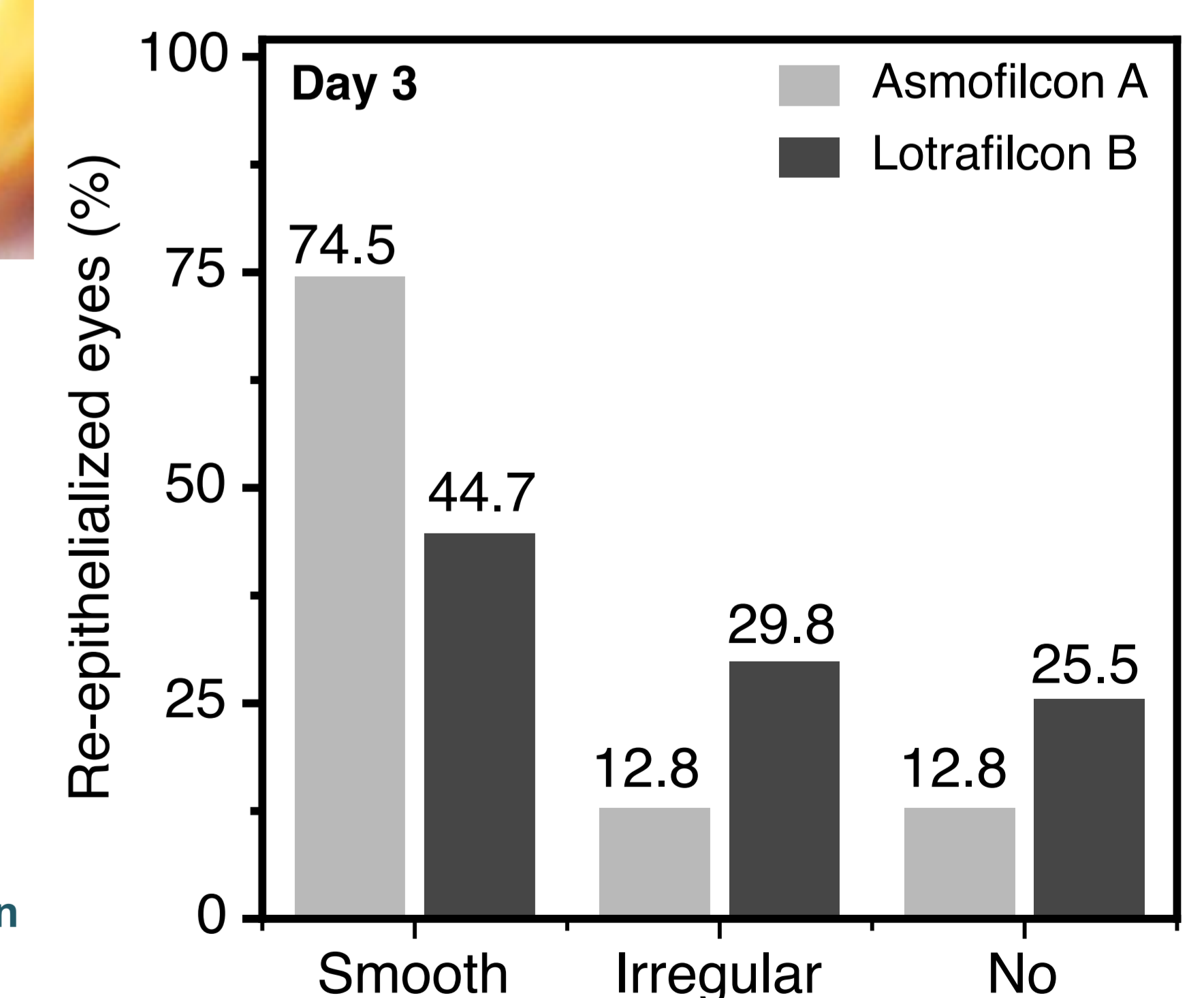


Figure 3: Slit lamp biomicroscopic images of an eye with smooth (epithelialized) suture (left) and an irregular suture (right).

An important observation concerned the quality of the suture (see Figure 3). At the 3rd post-operative day the 14/35 (29.8%) of re-epithelialised eyes showed irregular suture with Lotrafilcon B, compared to 6/41 (12.8%) eyes with Asmofilcon A lenses ($\chi^2=16.9$, p<0.001) (see figure 4).

Low amounts of retinal straylight were observed for both lenses (p=0.98), while no statistically significant difference was found in post-operative best-corrected visual acuity (p=0.68).

Figure 4: Plots of the proportion of eyes achieved complete re-epithelialization for the two silicone hydrogel lenses, at day 3, post-operatively.



4. CONCLUSIONS

SiH contact lenses, approved for continuous wear for one week, can be used as an effective bandage after PRK due to the limited time (~ 3 days) requested for achieving complete corneal re-epithelialisation.

Asmofilcon A lenses seem to result in a faster re-epithelialisation and a smoother suture compared to Lotrafilcon B lenses

References

- Engle AT, Laurent JM, Schallhorn SC et al. Masked comparison of silicone hydrogel lotrafilcon A and etafilcon A extended-wear bandage contact lenses after photorefractive keratectomy. J Cataract Refract Surg 2005;31:681-686.
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